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U.S. Department of the Interior • Bureau of Mines

MINERAL INDUSTRY SURVEYS

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MANGANESE IN JUNE 1993

Reported consumption of manganese ore containing 35% or more manganese, exclusive of that at iron and steel plants, increased 11% in June, compared with that of the previous month, to 34,000 metric tons, according to the U.S. Bureau of Mines. This brought the revised year-to-date total to 160,500 tons. These figures increase to 37,000 and 176,500, respectively, when estimates for annual respondents are added on the basis of 1992 data. Corresponding industry stocks of ore at the end of the month were 204,000 tons, a decrease of 2%. (Data for the most recent 13 months are graphed on page 3.)

The next report of data on domestic consumption and stocks of manganese ferroalloys and metal will be that for the April through June quarter of 1993. These data will appear in a later issue of this monthly report.

Foreign trade data for June will appear in a subsequent report. For the May foreign trade data tabulated in this report, imports of manganese units were down about 6% from the high level in April. Imports of 8,400 metric tons of high carbon ferromanganese from Russia was reported.

Data for 1992: Preliminary data tables from the forthcoming 1992 Manganese Annual Report are included with this report. Included are tables on manganese for materials in the Government stockpile; domestic consumption and stocks of ore, ferroalloys, and metal; unit consumption of manganese in ironmaking and steelmaking; U.S. foreign trade; U.S. supply-demand relationships; and world production of ore. Among developments in the manganese industry in 1992 also discussed in the Annual Report is that the average price, c.i.f. U.S. ports, for metallurgical ore containing 48% manganese was assessed as $3.25 per metric ton unit.

Prepared by the Branch of Metals and the Branch of Data Collection and Coordination, August 17, 1993.

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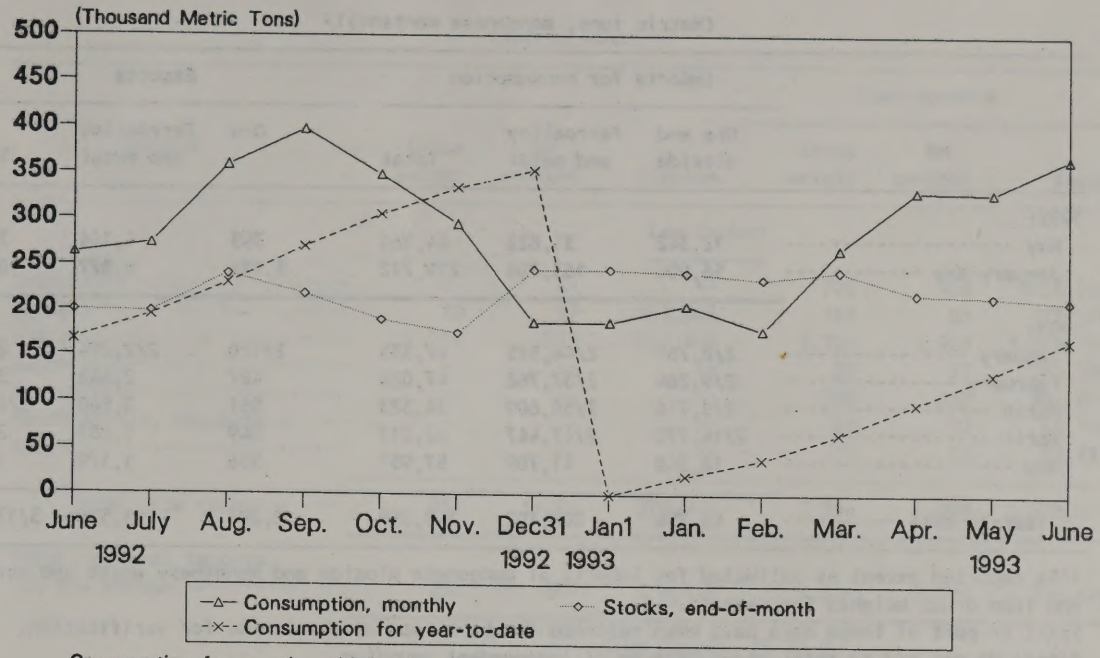
For June, the Defense Logistics Agency, U.S. Department of Defense, reported disposal of manganese products from the National Defense Stockpile as follows:

	Metric tons
Cash disposals	
Mn ore, chemical grade	1,542
Mn ore, metallurgical grade	7,257
Payment-in-kind disposals	
High carbon ferromanganese	2,161
Silicomanganese	9,072

Control of Mexico's manganese industry largely was assumed by the Grupo Ferrominero S.A. consortium following sale of Cía. Minera Autlán de C.V. (Autlán) and Ferroaleaciones de México, S.A. (Ferromex) to the consortium. The sales came about 4 years after Nacional Financiera, a development bank of the Mexican Government, foreclosed its controlling interest in Autlán and about 18 months after Ferromex shut down. Facilities involved in the sales represented most of Mexico's manganese ore and all of its manganese ferroalloy production, and consisted of the metallurgical and battery ore operations (Molango and Nonoalco mines), ferroalloy plants (Tamós and Teziutlán), and port facilities (Tampico) of Autlán and the ferroalloy plant (Gómez Palacios) of Ferromex. The price for Autlán was $23 million, reportedly only about one-eighth the value of the assets sold. South Africa's Samancor Ltd. provided technical assistance to Grupo Ferrominero and was reported to be a potential addition to the consortium.

An agreement reached between a French ferromanganese producer, Société du Ferromanganèse de Paris-Outreau (SFPO), and a South African manganese ore and ferroalloys producer, Samancor, was directed at adding medium-carbon ferromanganese to SFPO's product mix. Under the agreement, SFPO's coastal plant at Boulogne is to develop an annual capacity for medium-carbon ferromanganese in the range of 40,000 to 80,000 tons. Production is expected to exceed the low end of this range in 1994. Samancor will supply low-phosphorus manganese ore that SFPO, using an existing blast furnace, will smelt into high-carbon ferromanganese that will then be converted into medium-carbon ferromanganese in new facilities being tested. As part of the agreement, which is subject to approval by French authorities, Samancor will acquire a 5% shareholding in SFPO.

Manganese ore: U.S. reported consumption and industry stocks, exclusive of that at iron and steel plants.



Consumption for month multiplied by 10

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TABLE 1
SELECTED U.S. FOREIGN TRADE IN MANGANESE

(Metric tons, manganese content)1/

	Imports for consumption			Exports		
	Ore and dioxide	Ferroalloy and metal	Total	Ore	Ferroalloy and metal	Total
1992:						
May	12,342	31,822	44,164	393	1,144	1,537
January-May	56,006	163,706	219,712	3,914	6,877	10,791
1993:						
January	2/2,760	2/44,575	47,335	2/120	2/2,294	2,414
February	2/9,264	2/37,762	47,026	427	2,642	3,069
March	2/3,714	2/30,609	34,323	551	3,540	3/4,092
April	2/14,770	2/47,447	62,217	549	1,881	2,430
May	16,248	41,709	57,957	556	1,179	1,735
Year-to-date	46,756	202,102	248,858	2,203	11,536	3/13,739

1/As reported except as estimated for imports of manganese dioxide and manganese waste and scrap and from gross weights for exports.
2/All or part of these data have been referred to the Bureau of the Census for verification.
3/Data do not add to total shown because of independent rounding.

Source: Bureau of the Census.

TABLE 2
U.S. IMPORTS FOR CONSUMPTION OF SILICOMANGANESE
IN MAY 1993

(Metric tons)

Source				Year-to-date		
	Gross weight	Mn content	Value	Gross weight	Mn content	Value
Australia	7,055	4,646	$1,248,000	15,051	9,916	$4,446,003
Brazil	9,754	6,340	3,736,309	30,236	19,669	12,214,472
Canada	--	--	--	167	113	58,999
China	2,500	1,678	765,940	5,120	3,419	1,832,567
Croatia	--	--	--	7,550	4,908	3,200,690
France	--	--	--	1,354	908	652,108
Italy	--	--	--	5,200	1/2,392	2,156,960
Macedonia	--	--	--	5,535	3,598	2,497,747
Mexico	3,038	2,005	1,286,500	10,485	6,890	4,914,542
Norway	169	106	127,062	1,383	858	1,170,861
South Africa, Republic of	2,400	1,579	1,130,090	25,121	16,536	12,197,473
Spain	778	494	666,215	778	494	666,215
Ukraine	--	--	--	11,282	7,606	4,230,367
Venezuela	--	--	--	5,887	3,817	2,233,825
Total	25,694	16,848	8,960,116	125,149	2/81,123	52,472,829
Total, general imports	25,694	16,848	8,960,116	130,416	85,034	54,576,083

1/All or part of these data have been referred to the Bureau of the Census for verification.
2/Data do not add to total shown because of independent rounding.

Source: Bureau of the Census.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF FERROMANGANESE
IN MAY 1993

(Metric tons)

Source	May			Year-to-date		
	Gross weight	Mn content	Value	Gross weight	Mn content	Value
			Low Carbon			
China	--	--	--	700	560	$556,500
France	18	17	$33,003	100	81	177,378
Italy	234	213	337,915	2,126	1,923	3,049,732
Japan	--	--	--	32	27	65,596
Norway	--	--	--	338	267	352,812
South Africa, Republic of	--	--	--	20	17	40,710
Spain	--	--	--	18	16	33,721
Total, low carbon	252	1/229	370,918	3,334	2,891	4,276,449
Total, general imports of low carbon	252	229	370,918	3,334	2,891	4,276,449
			Medium Carbon, 1%-2% C			
Brazil	40	30	61,177	1,757	1,412	1,753,051
France	--	--	--	2,540	2,085	2,141,728
Germany	--	--	--	3,753	2/3,092	3,001,413
Japan	--	--	--	2,500	2,003	1,784,251
Mexico	1,350	945	359,168	11,775	9,225	7,647,691
South Africa, Republic of	1,276	1,034	1,009,545	4,572	3,695	3,649,605
Total, m.c., 1%-2% C	2,666	2,009	1,429,890	26,897	1/21,511	19,977,739
Total, general imports of m.c., 1%-2% C	2,666	2,009	1,429,890	26,897	21,511	19,977,739
			High Carbon			
Australia	2,000	1,536	730,000	12,500	9,625	4,607,500
Brazil	5,500	4,208	2,075,033	12,345	9,461	4,698,917
Canada	--	--	--	82	64	32,280
France	--	--	--	24,991	19,538	11,000,241
Mexico	1,600	1,040	394,640	1,600	1,040	394,640
Russia	8,439	6,154	2,535,245	8,439	6,154	2,535,245
South Africa, Republic of	10,763	8,441	4,314,628	54,813	43,090	23,467,831
United Kingdom	--	--	--	2,724	1,780	561,969
Total, high carbon	28,302	21,379	10,049,546	117,494	90,752	47,298,623
Total, general imports of high carbon	28,302	21,379	10,049,546	117,494	90,752	47,298,623
Grand total	31,220	23,617	11,850,354	147,725	115,154	71,552,811
Grand total, general imports	31,220	23,617	11,850,354	147,725	115,154	71,552,811

1/Data do not add to total shown because of independent rounding.
2/All or part of these data have been referred to the Bureau of the Census for verification.

Source: Bureau of the Census.

TABLE 4
U.S. IMPORTS1/ OF MANGANESE ORE (20% OR MORE MN)
IN MAY 1993

(Metric tons)

Source	20%-47% Mn		47% or more Mn		Total	
	Gross weight	Mn content	Gross weight	Mn content	Gross weight	Mn content
May 1993:						
Australia	--	--	15,124	7,900	15,124	7,900
Brazil	8,000	3,688	--	--	8,000	3,688
Gabon	--	--	7,644	3,975	7,644	3,975
Total	8,000	3,688	22,768	11,875	30,768	15,563
Year-to-date:						
Australia	--	--	33,794	17,072	33,794	17,072
Brazil	8,000	3,688	3,928	1,885	11,928	5,573
Gabon	17,064	2/7,679	19,496	10,152	36,560	17,831
Morocco	--	--	10	3/6	10	6
Total	25,064	11,367	57,228	29,115	82,292	40,482

1/Quantities for general imports and imports for consumption are identical.
2/All or part of these data have been referred to the Bureau of the Census for verification.
3/Includes U.S. Bureau of Mines conversion of reported data (apparent MnO2 content to Mn content).

Source: Bureau of the Census.

TABLE 5
U.S. IMPORTS FOR CONSUMPTION OF MANGANESE DIOXIDE
AND MANGANESE METAL IN MAY 1993

(Metric tons, gross weight)

Source	Manganese dioxide				Manganese metal, unwrought	
			Year-to-date			
	Quantity	Value	Quantity	Value	Quantity	Year-to-date
Australia	326	$450,689	2,468	1/$3,565,139	--	--
Belgium	199	353,710	1/830	1/1,139,612	--	--
Brazil	181	246,940	785	1,082,531	--	--
Canada	--	--	1/9	1/3,264	--	--
China	--	--	--	--	140	507
France	--	--	--	--	36	90
Germany	--	--	15	61,779	--	--
Ireland	318	465,240	2,878	4,163,960	--	--
Japan	18	43,370	61	141,901	--	--
Mexico	--	--	1/2,700	1/432,000	--	--
Russia	--	--	40	88,655	--	--
South Africa, Republic of	--	--	229	325,328	379	2,335
Sweden	--	--	1/100	1/27,780	--	--
Switzerland	--	--	--	--	--	18
United Kingdom	100	145,800	1/343	1/493,220	--	--
Total	1,142	1,705,749	2/10,457	11,525,169	555	2,950
Total, general imports	1,142	1,705,749	10,493	11,586,441	555	2,990

1/All or part of these data have been referred to the Bureau of the Census for verification.
2/Data do not add to total shown because of independent rounding.

Note: Imports for consumption of manganese, other, totaled 689 tons, of which 669 tons was from the Republic of South Africa, 17 tons was from China, and 3 tons was from France, to give a year-to-date total of 2,796 tons.

Note: No imports for consumption of metallic manganese waste and scrap were reported for the month, to give a year-to-date total of 156 tons1/.

Source: Bureau of the Census.

TABLE 6
U.S. EXPORTS OF MANGANESE ORE (20% OR MORE MN), FERROMANGANESE, SILICOMANGANESE, AND MANGANESE METAL BY COUNTRIES OF DESTINATION IN MAY 1993

(Metric tons, gross weight)

Destination	Manganese ore		Ferromanganese, 2% or less C		Silicomanganese		Manganese metal1/	
	Quantity	Year-to-date	Quantity	Year-to-date	Quantity	Year-to-date	Quantity	Year-to-date
Brazil	--	--	--	--	--	4	18	59
Canada	304	1,311	506	3,215	414	3,809	127	648
China	--	--	--	--	--	--	--	20
Colombia	--	--	5	30	--	--	--	--
Dominican Republic	--	10	--	2	--	--	--	--
Ecuador	--	324	--	--	--	--	--	--
El Salvador	--	--	--	2/20	--	--	--	--
Honduras	--	--	--	2/20	--	--	--	--
Hong Kong	--	--	--	--	--	--	20	40
Indonesia	--	--	--	990	--	--	--	5
Japan	606	711	--	--	--	--	43	566
Korea, Republic of	--	2/613	--	--	--	--	--	--
Mexico	--	3/52	--	15	184	2/319	17	3/105
Netherlands	--	16	--	--	--	--	--	273
Sweden	162	322	--	--	--	--	--	17
Taiwan	41	41	--	--	--	--	35	35
Trinidad and Tobago	--	--	--	21	--	--	--	--
United Kingdom	--	37	--	40	--	--	19	77
Venezuela	--	969	--	--	--	--	--	6
Total	1,113	4,406	511	4,353	598	4,132	279	4/1,852

1/Includes manganese-aluminum, some other alloys, and waste and scrap.
2/All or part of these data have been referred to the Bureau of the Census for verification.
3/Data revised by the Bureau of the Census.
4/Data do not add to total shown because of independent rounding.

Note: Exports of ferromanganese with more than 2% carbon totaled 128 tons, of which the largest quantity went to Canada, 39 tons, to give a year-to-date total of 4,518 tons.

Source: Bureau of the Census.

TABLE 7
U.S. FOREIGN TRADE IN SELECTED MANGANESE CHEMICALS IN MAY 1993, BY CLASS

(Metric tons, gross weight, and thousand dollars)

Class				Year-to-date		
	Quantity	Value	Principal sources and destinations: quantity; value	Quantity	Value	Principal sources and destinations: quantity; value
IMPORTS FOR CONSUMPTION						
Manganese oxides other than dioxide	130	237	Norway 41; $20	300	481	Japan 83; $251
Sulfates, basket category, including manganese sulfate	801	861	Mexico 274; $313	7,845	5,724	Mexico 4,811; $2,662
Potassium permanganate	109	241	Spain 89; $198	338	752	The Czech Republic 162; $275
Manganites, manganates, and other permanganates	6	15	Canada 6; $15	12	31	Canada 12; $31
EXPORTS						
Manganese dioxide	325	395	Canada 222; $117	1,699	1,703	Canada 1,186; $859
Manganese oxides other than dioxide	577	308	Canada 534; $192	2,571	1,503	Canada 2,237; $665
Sulfates, basket category, including manganese sulfate	1,545	751	Canada 1,303; $328	6,784	4,358	Canada 5,490; $1,338
Manganites, manganates, and permanganates	63	168	Germany 47; $89	339	869	Germany 218; $543

Source: Bureau of the Census.

PREVIEW

Selected Tables From The
1992 Annual Report (in preparation)

TABLE 2
U.S. GOVERNMENT DISPOSAL AUTHORITIES AND YEAREND INVENTORIES
FOR MANGANESE MATERIALS IN 1992

(Metric tons, gross weight)

Material	Disposal authority	Physical inventory, Dec. 31				
		Uncommitted			Sold, pending shipment	Grand total1/
		Stockpile grade	Nonstockpile grade	Total1/		
Natural battery ore	166,107	150,517	15,590	166,107	12,428	178,534
Synthetic manganese dioxide	2,732	2,732	--	2,732	--	2,732
Chemical ore	156,711	156,630	81	156,711	378	157,089
Metallurgical ore	1,572,050	1,155,826	416,223	1,572,050	302,576 /2	1,874,625
High-carbon ferromanganese	851,199	973,331	--	973,331	10,306 /2	983,636
Medium-carbon ferromanganese	--	22,745	--	22,745	2,704 /2	25,448
Silicomanganese	--	12,149	--	12,149	--	12,149
Electrolytic metal	--	12,857	--	12,857	--	12,857

1/Data may not add to totals shown because of independent rounding.
2/Includes quantities reserved for payment-in-kind disposal.

TABLE 4
U.S. CONSUMPTION AND INDUSTRY STOCKS
OF MANGANESE ORE,1/ BY USE

(Metric tons, gross weight)

Use	Consumption		Stocks, Dec. 31	
	1991	1992	1991	1992
Manganese alloys and metal	W	W	W	W
Pig iron and steel	47,000	49,000	27,000	20,000
Dry cells, chemicals, miscellaneous2/	W	W	W	W
Total	473,000	438,000	275,000	276,000

W Withheld to avoid disclosing company proprietary data; included in "Total."
1/Containing 35% or more manganese (natural).
2/Natural ore, including that consumed in making synthetic manganese dioxide.

TABLE 5
U.S. CONSUMPTION, BY END USE, AND INDUSTRY STOCKS OF MANGANESE FERROALLOYS AND METAL IN 1992

(Metric tons, gross weight)

End use	Ferromanganese			Silico-manganese	Manganese metal
	High carbon	Medium and low carbon	Total1/		
Steel:					
Carbon	190,839	72,657	263,496	76,589	2,450
Stainless and heat-resisting	13,679	(2/)	13,679	5,169	1,768
Full alloy	20,942	5,283	26,225	15,728	464
High-strength, low-alloy	18,811	2,563	21,374	4,915	(2/)
Unspecified3/	389	689	1,079	546	260
Total steel1/	244,661	81,192	325,853	102,947	4,943
Cast irons	10,809	585	11,394	11,355	6
Superalloys	W	--	W	--	103
Alloys (excluding alloy steels and superalloys)	1,102	275	1,377	(4/)	19,659 /5
Miscellaneous and unspecified	W	--	W	(4/)	W
Total consumption1/	256,572	82,052	338,624	114,303 /6	24,712
Total manganese content7/	200,000	66,000	266,000	75,000	25,000
Stocks, Dec. 31:					
Consumers and producers	22,370	6,059	28,429	7,106	(8/)

W Withheld to avoid disclosing company proprietary data; included in "Alloys (excluding alloy steels and superalloys)."
1/Data may not add to totals shown because of independent rounding.
2/Withheld to avoid disclosing company proprietary data; included in "Steel: Unspecified."
3/Includes electric and tool steel, and items indicated by (2/).
4/Withheld to avoid disclosing company proprietary data; included in "Cast irons."
5/Approximately 85% of this combined total was for consumption in aluminum alloys.
6/Internal evaluation indicates that silicomanganese consumption is considerably understated.
7/Estimated based on typical percent manganese content (rounded).
8/Withheld to avoid disclosing company proprietary data.

TABLE 6
U.S. UNIT CONSUMPTION OF MANGANESE IN IRONMAKING AND STEELMAKING

(Kilograms per metric ton of raw steel unless otherwise specified)

Form used	1991	1992
IRONMAKING		
Basis: Production of raw steel, million tons1/	79.74	84.32
Ore2/	.24	.26
STEELMAKING		
Basis: Production of raw steel and steel castings, million tons	80.65	85.27 /e
Ore2/	--	(3/)
Ferromanganese	3.24	3.00
Silicomanganese	.80	.80
Manganese metal	.06	.06
Total, steelmaking4/	4.11	3.85

e/Estimated.
1/As ingots, continuous- or pressure-cast blooms, billets, slabs, etc.
2/Containing 35% or more manganese.
3/Less than 1/2 unit.
4/Data may not add to totals shown because of independent rounding.

TABLE 8
U.S. EXPORTS OF MANGANESE ORE,
FERROALLOYS, AND METAL, BY COUNTRY

Country	1991		1992	
	Gross weight (metric tons)	Value (thousands)	Gross weight (metric tons)	Value (thousands)
	ORE AND CONCENTRATES WITH 20% OR MORE MANGANESE			
Belgium	778	$62	1,024	$82
Canada	26,895	2,152	10,612	1,942
Korea, Republic of	3,128	326	1,308	175
Mexico1/	30,528	5,496	--	--
Other	4,963 /2	487 /2	142	96
Total	66,292	8,523	13,086	2,295
	FERROMANGANESE, ALL GRADES			
Belgium	363	620	200	366
Canada	11,920	11,681	10,469	9,025
Mexico	444	480	995	860
Sweden	371	428	34	63
United Kingdom	908	1,515	1,221	2,181
Other	568	690	484	500
Total3/	14,573	15,414	13,404	12,996
	SILICOMANGANESE			
Canada	1,948	1,932	8,681	6,139
Mexico	874	804	416	277
Other	52	66	74	84
Total3/	2,873	2,802	9,171	6,500
	METAL, INCLUDING ALLOYS AND WASTE AND SCRAP			
Canada	1,611	4,407	1,798	4,777
Japan	161	2,005	1,011	2,028
Netherlands	1,776	4,223	1,545	3,564
Other	1,723	2,023	650	1,576
Total3/	5,272	12,658	5,005	11,946

1/Includes quantities believed transshipped from Gabon, about 25,000 tons in 1991.
2/Unspecified group of countries differs from that in the 1991 Minerals Yearbook.
3/Data may not add to totals shown because of independent rounding.

Source: Bureau of the Census.

TABLE 9
U.S. IMPORTS FOR CONSUMPTION OF MANGANESE ORE, FERROALLOYS, METAL, AND SELECTED CHEMICALS, BY COUNTRY

Country	1991			1992		
	Gross weight (metric tons)	Manganese content (metric tons)	Value (thousands)	Gross weight (metric tons)	Manganese content (metric tons)	Value (thousands)
ORE AND CONCENTRATES WITH 20% OR MORE MANGANESE						
All grades						
Australia	32,962	16,485	$4,620	50,518	25,519	$5,184
Brazil	4,874	2,583	407	38,732	15,541	2,225
Canada1/	11	5	4	--	--	--
Gabon2/	158,685	79,997	29,801	148,617	75,354	20,970
Ghana	10,332	4,594	1,209	--	--	--
Mexico3/	10,586	4,673	1,356	8,566	3,930	1,556
Morocco	87	44 /4	25	105	56 /4	32
Norway1/	16,322	8,872	2,911	--	--	--
Total5/	233,860	117,255	40,332	246,538	120,400	29,967
More than 20% but less than 47% manganese						
Brazil	--	--	--	35,426	13,953	1,916
Gabon	--	--	--	2,500	1,138	371
Ghana	10,332	4,594	1,209	--	--	--
Mexico3/	7,621	3,102	949	7,233	3,264	1,343
Total	17,953	7,696	2,158	45,159	18,355	3,630
47% or more manganese						
Australia	32,962	16,485	4,620	50,518	25,519	5,184
Brazil	4,874	2,583	407	3,307	1,588	308
Canada1/	11	5	4	--	--	--
Gabon2/	158,685	79,997	29,801	146,117	74,216	20,599
Mexico	2,965	1,571	407	1,332	666	213
Morocco	87	44 /4	25	105	56 /4	32
Norway1/	16,322	8,872	2,911	--	--	--
Total5/	215,907	109,560	38,174	201,379	102,045	26,337
FERROMANGANESE						
All grades						
Australia	9,400	6,902	3,510	24,280	17,707	7,413
Brazil	32,559	25,039	16,817	33,468	25,786	16,189
Canada	11,125	8,595	4,773	244	196	95
China	4,521	3,438	2,366	2,620	2,154	2,014
France	83,104	65,394	52,617	81,793	64,247	41,883
Germany	18,174	14,479	15,183	15,497	12,657	12,784
Italy	945	841	1,393	4,978	4,477	7,256
Mexico	41,299	32,868	27,439	20,551	16,468	16,832
Norway	12,363	9,830	6,725	19,800	16,009	15,200
Philippines	5,652	4,354	2,721	--	--	--
South Africa, Republic of	81,068	63,415	44,850	82,976	64,895	39,244
United Kingdom	15,178	11,734	6,980	16,005	12,369	6,833
Other	4,394 /6	3,585 /6	3,788 /6	1,945	1,505	1,071
Total5/	319,781	250,473	189,162	304,157	238,470	166,815
1% or less carbon						
China	--	--	--	1,285	1,065	1,036
France	11,375	10,127	16,166	4,263	3,785	6,400
Italy	945	841	1,393	4,978	4,477	7,256
Japan	1,221	1,110	1,782	265	240	388
Other	44 /6	38 /6	68 /6	398	333	360
Total5/	13,584	12,116	19,409	11,190	9,901	15,440

See footnotes at end of table.

TABLE 9 -- Continued
U.S. IMPORTS FOR CONSUMPTION OF MANGANESE ORE, FERROALLOYS, METAL, AND SELECTED CHEMICALS, BY COUNTRY

Country	1991			1992		
	Gross weight (metric tons)	Manganese content (metric tons)	Value (thousands)	Gross weight (metric tons)	Manganese content (metric tons)	Value (thousands)
			More than 1% to 2% or less carbon			
Brazil	--	--	--	3,905	3,143	$3,230
China	--	--	--	1,336	1,088	978
France	1,920	1,524	$1,287	--	--	--
Germany	18,174	14,479	15,183	15,497	12,657	12,784
Mexico	18,850	15,211	15,700	20,551	16,468	16,832
Norway	8,811	7,030	5,202	17,470	14,230	14,003
South Africa, Republic of	5,883	4,738	5,114	7,368	5,926	6,150
Other	1,407	1,171	1,116	--	--	--
Total5/	55,045	44,152	43,602	66,126	53,513	53,977
			More than 4% carbon			
Australia	9,400	6,902	3,510	24,280	17,707	7,413
Brazil	32,559	25,039	16,817	29,563	22,642	12,960
Canada	11,091	8,570	4,763	224	177	65
China	4,521	3,438	2,366	--	--	--
France	69,810	53,743	35,164	77,530	60,461	35,483
Mexico	22,448	17,657	11,739	--	--	--
Philippines	5,652	4,354	2,721	--	--	--
South Africa, Republic of	75,185	58,677	39,736	75,608	58,969	33,095
United Kingdom	15,178	11,734	6,980	16,005	12,369	6,833
Other	5,309	4,090	2,355	3,632	2,729	1,550
Total5/	251,151	194,205	126,151	226,841	175,056	97,399
			SILICOMANGANESE			
Argentina	8,176	5,314	3,721	12,348	8,026	4,299
Australia	37,216	24,438	17,159	31,984	20,869	12,213
Brazil	49,365	32,149	23,498	57,056	37,140	24,479
Canada	15,682	10,509	7,616	142	95	74
China	5,305	3,514	2,665	11,423	7,476	5,096
France	9,938	6,642	5,543	11,841	7,939	5,533
Macedonia7/	--	--	--	8,822	6,011	4,014
Mexico	22,955	15,052	11,770	19,812	12,728	10,228
Norway	15,733	10,214	9,942	10,746	6,940	7,881
South Africa, Republic of	62,129	41,290	32,088	64,013	42,315	31,063
Ukraine	--	--	--	7,992	5,971	3,237
Venezuela	2,500	1,666	1,300	8,900	5,594	3,921
Yugoslavia8/	22,880	14,845	11,343	8,699	5,792	3,954
Other	6,414 /6	4,151 /6	4,034 /6	3,398	2,152	2,471
Total5/	258,293	169,784	130,677	257,177	169,047	118,464
			METAL			
Unwrought:						
China	997	XX	1,298	1,480	XX	2,001
South Africa, Republic of	8,634	XX	13,585	6,709	XX	10,304
Other	2	XX	4	183	XX	288
Total5/	9,632	XX	14,887	8,372	XX	12,593
Other:						
South Africa, Republic of	5,908	XX	9,007	5,152	XX	7,789
Other	148	XX	558	355	XX	1,563
Total5/	6,057	XX	9,565	5,507	XX	9,353
Waste and scrap:						
Canada	62	XX	7	69	XX	41
Mexico	--	XX	--	4	XX	4
Venezuela	40	XX	50	--	XX	--

See footnotes at end of table.

TABLE 9 -- Continued
U.S. IMPORTS FOR CONSUMPTION OF MANGANESE ORE, FERROALLOYS, METAL, AND SELECTED CHEMICALS, BY COUNTRY

Country	1991			1992		
	Gross weight (metric tons)	Manganese content (metric tons)	Value (thousands)	Gross weight (metric tons)	Manganese content (metric tons)	Value (thousands)
			MANGANESE DIOXIDE			
Australia	8,415	XX	$12,255	9,939	XX	$14,655
Belgium	1,445	XX	2,238	933	XX	1,502
Brazil	1,641	XX	2,242	1,130	XX	1,554
Ireland	6,288	XX	9,013	7,491	XX	10,758
South Africa, Republic of	1,956	XX	2,700	1,403	XX	1,960
Other	269	XX	727	252	XX	661
Total5/	20,016	XX	29,174	21,149	XX	31,089
			POTASSIUM PERMANGANATE			
China	374	XX	348	116	XX	115
Czechoslovakia	90	XX	138	664	XX	1,114
Germany	273	XX	451	158	XX	288
Spain	181	XX	388	26	XX	65
Other	56 /6	XX	225 /6	80	XX	353
Total	974	XX	1,550	1,044	XX	1,935

XX Not applicable.
1/Country of transshipment rather than original source.
2/Includes quantities believed transshipped to Mexico, about 25,000 tons in 1991.
3/Includes U.S. Bureau of Mines revision of part of reported data.
4/Includes U.S. Bureau of Mines conversion of part of reported data (from apparent MnO_2 content to Mn content).
5/Data may not add to totals shown because of independent rounding.
6/Unspecified group of countries differs from that in the 1991 Minerals Yearbook.
7/Formerly part of Yugoslavia; shipments prior to June 1, 1992 included in Yugoslavia.
8/Dissolved in 1992. Includes shipments from all republics prior to June 1, 1992, and from Serbia and Montenegro after June 1, 1992.

Source: Bureau of the Census, adjusted by the U.S. Bureau of Mines.

TABLE 13
MANGANESE ORE: WORLD PRODUCTION, BY COUNTRY1/

(Thousand metric tons)

Country2/	Range percent Mne/ 3/	Gross weight					Metal Content				
		1988	1989	1990	1991	1992e/	1988	1989	1990	1991	1992e/
Australia4/	37-53	1,985	2,124	1,920	r/1,482	1,200	945	e/1,008	e/909	e/701	570
Bosnia and Herzegovina5/ 6/	25-45	--	--	--	--	15	--	--	--	--	5
Brazil7/ 8/	30-50	r/1,991	r/1,904	r/2,300	r/2,000	1,800	763	r/724	r/874	r/760	684
Bulgaria	29-35	34	32	r/39	r/ e/35	35	10	11	r/11	r/ e/10	10
Chile	30-40	44	44	40	r/44	44	15	14	12	e/13	13
China7/ 9/	20-30	3,212	3,331	e/3,300	e/3,400	3,500	642	666	660	680	700
Gabon7/ 11/	50-53	2,254	2,592	2,423	r/1,620	10/1,556	1,040	1,197	r/1,118	r/748	718
Georgia12/	29-30	--	--	--	--	1,200	--	--	--	--	350
Ghana7/	30-50	260	279	247	r/320	10/279	97	110	96	r/120	107
Hungary7/ 13/	30-33	81	84	60	r/30	18	26	26	19	r/9	6
India7/ 11/ 14/	10-54	1,333	1,334	1,393	r/1,401	1,400	496	497	r/522	r/525	525
Iran7/	25-35	75	81	54	r/48	50	23	24	r/18	r/16	16
Kazahstan12/	29-30	--	--	--	--	9	--	--	--	--	3
Mexico15/	27-50	444	394	365	r/254	10/407	169	150	139	r/93	153
Morocco7/	50-53	30	32	r/49	r/59	59	16	17	r/26	31	31
Romania7/ 13/	30	65	60	55	50	45	20	18	17	15	14
South Africa, republic of7/ 11/	30-48+	4,023	4,884	4,402	r/3,146	10/2,464	1,656	2,044	1,911	r/1,369	1,077
Ukraine12/	29-30	--	--	--	--	5,800	--	--	--	--	1,700
U.S.S.R.16/	29-30	9,108	9,141	8,500	r/7,240	--	2,700	10/2,740	2,500	r/2,150	--
Yugoslavia6/ 17/	25-45	40	39	51	e/40	--	14	14	18	e/14	--
Other18/	XX	35	33	54	43	48	15	15	24	19	21
Toatal19/	XX	r/25,014	r/26,389	r/25,252	r/21,213	19,929	r/8,646	r/9,273	r/8,875	r/7,273	6,701

e/Estimated. r/Revised. XX Not applicable.
1/Table includes data available through July 12, 1993. Data pertain to concentrates or comparable shipping product, except that in a few instances the best data available appear to be for crude ore, possibly after some upgrading.
2/In addition to the countries listed, Colombia, Cuba, Panama, Peru, and Sudan may have produced manganese ore and/or manganiferous ore, but available information is inadequate to make reliable estimates of output levels. Low-grade ore not included in this table has been reported as follows, in thousand metric tons, gross weight: Argentina (19%-30% Mn), 1988--9 (revised); 1989--6; 1990--4 (revised estimate); 1991--5 (revised), and 1992--4; and Czechoslovakia (about 17% Mn), an estimated 1 in each year.
3/May be for average content of each year's production rather than for content of typical products.
4/Metallurgical ore.
5/Formerly part of Yugoslavia.
6/All production in Yugoslavia from 1988-91 came from Bosnia and Herzegovina.
7/Gross weight reported; metal content estimated. Estimated metal content figures have been revised as necessary.
8/For 1989-92, production of beneficiated ore as reported in Sumario Mineral (Brasilia); for 1988, the same plus direct-shipping manganese ore as reported in Anuario Mineral Brasileiro, the latest year for which such data were available.
9/Includes manganiferous ore.
10/Reported figure.
11/Calculated metal content includes allowance for assumed moisture content.
12/Formerly part of the U.S.S.R.; data were not reported separately until 1992.
13/Concentrate.
14/Much of India's production grades below 35% Mn; average content was reported as 38% Mn in 1985.
15/Mostly oxide nodules; may include smaller quantities of direct-shipping carbonate and oxide ores for metallurgical and battery applications. Gross weight is calculated from reported metal content data.
16/Dissolved in Dec. 1991.
17/Dissolved in Apr. 1992.
18/Category represents the combined totals of Burma, Egypt, Greece, Indonesia, Italy (from wastes), Japan, the Philippines, Thailand, Turkey, and Zambia.
19/Data may not add to totals shown because of independent rounding.

TABLE 14
MANGANESE SUPPLY-DEMAND RELATIONSHIPS1/

(Thousand metric tons, manganese content)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
COMPONENTS AND DISTRIBUTION OF U.S. SUPPLY											
Domestic mines2/	22	4	4	10	2	1	2	1	1	1	--
Shipments of Government stockpile excesses	116	25	32	9	83	7	95	(2)	(5)	20	29
Imports, ore and dioxide	273	101	161	163	185	215	164	238	275	153	129
Imports, ferroalloy and metal	558	390	330	386	367	410	383	527	502	458	436
Industry stocks, Jan. 1	644	637	523	420	381	345	286	253	287	294	241
Total U.S. supply3/	1,613	1,157	1,050	989	1,018	978	930	1,017	1,059	926	836
Distribution of U.S. supply:											
Industry stocks, Dec. 31	637	523	419	381	345	286	253	287	294	241	186
Exports, ore	29	13	9	27	28	21	34	32	26	42	33
Exports, ferroalloy and metal	15	12	15	12	12	9	8	16	15	13	19
Industrial demand	932	610	606	569	633	662	634	682	723	630	598
U.S. DEMAND PATTERN4/											
Appliances and equipment	46	27	30	33	29	24	28	17	11	9	8
Batteries	15	19	23	31	35	39	39	44	41	42	52
Cans and containers	42	28	25	34	32	28	32	28	21	22	20
Chemicals5/	45	26	20	31	20	21	40	42	39	36	33
Construction	229	138	137	154	149	134	150	221	138	138	122
Machinery	155	83	82	88	71	59	70	100	75	74	45
Oil and gas industries	81	36	25	33	31	23	27	19	9	14	10
Transportation	194	104	117	126	112	86	95	93	49	45	47
Other6/	125	147	147	39	154	248	153	119	340	250	260
Total U.S. primary demand3/	932	610	606	569	633	662	634	682	723	630	598

1/Where available, data for manganese dioxide included beginning in 1984.
2/Including manganiferous ore.
3/Data may not add to totals shown because of independent rounding.
4/New series for steel-related end uses beginning in 1989.
5/Includes miscellaneous nonmetallurgical uses of ore beginning in 1987.
6/Not specifically based on reported data; includes processing losses. Through 1988, the distribution within this category is approximately the same as for end uses above exclusive of batteries and chemicals. Beginning in 1989, includes nonidentified uses of steel corresponding to about one-third of total steel shipments.

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